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SEQUENCE LISTING

<110> MONASH UNIVERSITY

<120> Immunotherapeutic and immunoprophylactic reagents

<130> 12187260/TDO

<150> PS1482

<151> 2002-04-02

<160> 61

<170> PatentIn version 3.1

<210> 1

<211> 241

<212> PRT

<213> Lolium perenne

<400> 1

Ile Ala Lys Val Pro Pro Gly Pro Asn Ile Thr Ala Glu Tyr Gly Asp
1 5 10 15

Lys Trp Leu Asp Ala Lys Ser Thr Trp Tyr Gly Lys Pro Thr Gly Ala
20 25 30

Gly Pro Lys Asp Asn Cys Gly Ala Cys Gly Tyr Lys Asp Val Asp Lys
35 40 45

Ala Pro Phe Asn Gly Met Thr Gly Cys Gly Asn Thr Pro Ile Phe Lys
50 55 60

Asp Gly Arg Gly Cys Gly Ser Cys Phe Glu Ile Lys Cys Thr Lys Pro
65 70 75 80

Glu Ser Cys Ser Gly Glu Ala Val Thr Val Thr Ile Thr Asp Asp Asn
85 90 95

Glu Glu Pro Ile Ala Pro Tyr His Phe Asp Leu Ser Gly His Ala Phe
100 105 110

Gly Ser Met Ala Lys Lys Gly Glu Glu Gln Lys Leu Arg Ala Ser Ala
115 120 125

Gly Glu Leu Glu Leu Gln Phe Arg Arg Val Lys Cys Lys Tyr Pro Asp
130 135 140

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Gly Thr Lys Pro Thr Phe His Val Glu Lys Ala Ser Asn Pro Asn Tyr
145 150 155 160

Leu Ala Ile Leu Val Lys Tyr Val Asp Gly Asp Gly Asp Val Val Ala
165 170 175

Val Asp Ile Lys Glu Lys Gly Lys Asp Lys Trp Ile Glu Leu Lys Glu
180 185 190

Ser Trp Gly Ala Val Trp Arg Ile Asp Thr Pro Asp Lys Leu Thr Gly
195 200 205

Pro Phe Thr Val Arg Tyr Thr Thr Glu Gly Gly Thr Lys Ser Glu Val
210 215 220

Glu Asp Val Ile Pro Glu Gly Trp Lys Ala Asp Thr Ser Tyr Ser Ala
225 230 235 240

Lys

<210> 2
<211> 276
<212> PRT
<213> Lolium perenne

<400> 2

Ala Asp Ala Gly Tyr Thr Pro Ala Ala Ala Thr Pro Ala Thr Pro
1 5 10 15

Ala Ala Thr Pro Ala Ala Ala Gly Gly Lys Ala Thr Thr Asp Glu Gln
20 25 30

Lys Leu Leu Glu Asp Val Asn Ala Gly Phe Lys Ala Ala Val Ala Ala
35 40 45

Ala Ala Asn Ala Pro Pro Ala Asp Lys Phe Lys Ile Phe Glu Ala Ala
50 55 60

Phe Ser Glu Ser Ser Lys Gly Leu Leu Ala Thr Ser Ala Ala Lys Ala
65 70 75 80

Pro Gly Leu Ile Pro Lys Leu Asp Thr Ala Tyr Asp Val Ala Tyr Lys

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85	90	95
Ala Ala Glu Gly Ala Thr Pro Glu Ala Lys Tyr Asp Ala Phe Val Thr		
100	105	110
Ala Leu Thr Glu Ala Leu Arg Val Ile Ala Gly Ala Leu Glu Val His		
115	120	125
Ala Val Lys Pro Ala Thr Glu Glu Val Pro Ala Ala Lys Ile Pro Thr		
130	135	140
Gly Glu Leu Gln Ile Val Asp Lys Ile Asp Ala Ala Phe Lys Ile Ala		
145	150	155
Ala Thr Ala Ala Asn Ala Ala Pro Thr Asn Asp Lys Phe Thr Val Phe		
165	170	175
Glu Ser Ala Phe Asn Lys Ala Leu Asn Glu Cys Thr Gly Gly Ala Tyr		
180	185	190
Glu Thr Tyr Lys Phe Ile Pro Ser Leu Glu Ala Ala Val Lys Gln Ala		
195	200	205
Tyr Ala Ala Thr Val Ala Ala Ala Pro Glu Val Lys Tyr Ala Val Phe		
210	215	220
Glu Ala Ala Leu Thr Lys Ala Ile Thr Ala Met Thr Gln Ala Gln Lys		
225	230	235
Ala Gly Lys Pro Ala Ala Ala Ala Ala Thr Gly Ala Ala Thr Val Ala		
245	250	255
Thr Gly Ala Ala Thr Ala Ala Ala Gly Ala Ala Thr Ala Ala Ala Gly		
260	265	270
Gly Tyr Lys Ala		
275		

<210> 3
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 <213> Lolium perenne
 <400> 3

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Ile Ala Lys Val Pro Pro Gly Pro Asn Ile Thr Ala Glu Tyr Gly Asp
 1 5 10 15

Lys Trp Leu Asp
 20

<210> 4
 <211> 20
 <212> PRT
 <213> Lolium perenne

<400> 4

Ile Thr Ala Glu Tyr Gly Asp Lys Trp Leu Asp Ala Lys Ser Thr Trp
 1 5 10 15

Tyr Gly Lys Pro
 20

<210> 5
 <211> 20
 <212> PRT
 <213> Lolium perenne

<400> 5

Leu Asp Ala Lys Ser Thr Trp Tyr Gly Lys Pro Thr Gly Ala Gly Pro
 1 5 10 15

Lys Asp Asn Gly
 20

<210> 6
 <211> 20
 <212> PRT
 <213> Lolium perenne

<400> 6

Lys Pro Thr Gly Ala Gly Pro Lys Asp Asn Gly Gly Ala Cys Gly Tyr
 1 5 10 15

Lys Asp Val Asp
 20

<210> 7
 <211> 20
 <212> PRT

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<213> Lolium perenne

<400> 7

Asn	Gly	Gly	Ala	Cys	Gly	Tyr	Lys	Asp	Val	Asp	Lys	Ala	Pro	Phe	Asn
1				5					10					15	

Gly	Met	Thr	Gly
			20

<210> 8

<211> 20

<212> PRT

<213> Lolium perenne

<400> 8

Val	Asp	Lys	Ala	Pro	Phe	Asn	Gly	Met	Thr	Gly	Cys	Gly	Asn	Thr	Pro
1				5					10					15	

Ile	Phe	Lys	Asp
			20

<210> 9

<211> 20

<212> PRT

<213> Lolium perenne

<400> 9

Thr	Gly	Cys	Gly	Asn	Thr	Pro	Ile	Phe	Lys	Asp	Gly	Arg	Gly	Cys	Gly
1				5					10					15	

Ser	Cys	Phe	Glu
			20

<210> 10

<211> 20

<212> PRT

<213> Lolium perenne

<400> 10

Lys	Asp	Gly	Arg	Gly	Cys	Gly	Ser	Cys	Phe	Glu	Ile	Lys	Cys	Thr	Lys
1				5					10					15	

Pro	Glu	Ser	Cys
			20

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<210> 11
 <211> 20
 <212> PRT
 <213> Lolium perenne

<400> 11

Phe Glu Ile Lys Cys Thr Lys Pro Glu Ser Cys Ser Gly Glu Ala Val
 1 5 10 15

Thr Val Thr Ile
 20

<210> 12
 <211> 20
 <212> PRT
 <213> Lolium perenne

<400> 12

Ser Cys Ser Gly Glu Ala Val Thr Val Thr Ile Thr Asp Asp Asn Glu
 1 5 10 15

Glu Pro Ile Ala
 20

<210> 13
 <211> 20
 <212> PRT
 <213> Lolium perenne

<400> 13

Thr Ile Thr Asp Asp Asn Glu Glu Pro Ile Ala Pro Tyr His Phe Asp
 1 5 10 15

Leu Ser Gly His
 20

<210> 14
 <211> 20
 <212> PRT
 <213> Lolium perenne

<400> 14

Ile Ala Pro Tyr His Phe Asp Leu Ser Gly His Ala Phe Gly Ser Met
 1 5 10 15

Ala Lys Lys Gly

- 7 -

20

<210> 15
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 <213> Lolium perenne

<400> 15

Gly His Ala Phe Gly Ser Met Ala Lys Lys Gly Glu Glu Gln Asn Val
 1 5 10 15

Arg Ser Ala Gly
 20

<210> 16
 <211> 20
 <212> PRT
 <213> Lolium perenne

<400> 16

Lys Gly Glu Glu Gln Asn Val Arg Ser Ala Gly Glu Leu Glu Leu Gln
 1 5 10 15

Phe Arg Arg Val
 20

<210> 17
 <211> 20
 <212> PRT
 <213> Lolium perenne

<400> 17

Ala Gly Glu Leu Glu Leu Gln Phe Arg Arg Val Lys Cys Lys Tyr Pro
 1 5 10 15

Asp Asp Thr Lys
 20

<210> 18
 <211> 20
 <212> PRT
 <213> Lolium perenne

<400> 18

Arg Val Lys Cys Lys Tyr Pro Asp Asp Thr Lys Pro Thr Phe His Val
 1 5 10 15

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Glu Lys Gly Ser
20

<210> 19
<211> 20
<212> PRT
<213> Lolium perenne

<400> 19

Thr Lys Pro Thr Phe His Val Glu Lys Gly Ser Asn Pro Asn Tyr Leu
1 5 10 15

Ala Ile Leu Val
20

<210> 20
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<213> Lolium perenne

<400> 20

Gly Ser Asn Pro Asn Tyr Leu Ala Ile Leu Val Lys Tyr Val Asp Gly
1 5 10 15

Asp Gly Asp Val
20

<210> 21
<211> 20
<212> PRT
<213> Lolium perenne

<400> 21

Leu Val Lys Tyr Val Asp Gly Asp Gly Asp Val Val Ala Val Asp Ile
1 5 10 15

Lys Glu Lys Gly
20

<210> 22
<211> 20
<212> PRT
<213> Lolium perenne

<400> 22

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Asp Val Val Ala Val Asp Ile Lys Glu Lys Gly Lys Asp Lys Trp Ile
 1 5 10 15

Glu Leu Lys Glu
 20

<210> 23
 <211> 20
 <212> PRT
 <213> Lolium perenne

<400> 23

Lys Gly Lys Asp Lys Trp Ile Glu Leu Lys Glu Ser Trp Gly Ala Val
 1 5 10 15

Trp Arg Ile Asp
 20

<210> 24
 <211> 20
 <212> PRT
 <213> Lolium perenne

<400> 24

Lys Glu Ser Trp Gly Ala Val Trp Arg Ile Asp Thr Pro Asp Lys Leu
 1 5 10 15

Thr Gly Pro Phe
 20

<210> 25
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<400> 25

Ile Asp Thr Pro Asp Lys Leu Thr Gly Pro Phe Thr Val Arg Tyr Thr
 1 5 10 15

Thr Glu Gly Gly
 20

<210> 26
 <211> 20
 <212> PRT

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<213> Lolium perenne

<400> 26

Pro Phe Thr Val Arg Tyr Thr Thr Glu Gly Gly Thr Lys Ser Glu Val
1 5 10 15

Glu Asp Val Ile
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<210> 27

<211> 20

<212> PRT

<213> Lolium perenne

<400> 27

Gly Gly Thr Lys Ser Glu Val Glu Asp Val Ile Pro Glu Gly Trp Lys
1 5 10 15

Ala Asp Thr Ser
20

<210> 28

<211> 20

<212> PRT

<213> Lolium perenne

<400> 28

Ser Glu Val Glu Asp Val Ile Pro Glu Gly Trp Lys Ala Asp Thr Ser
1 5 10 15

Tyr Ser Ala Lys
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<210> 29

<211> 20

<212> PRT

<213> Lolium perenne

<400> 29

Ala Asp Ala Gly Tyr Thr Pro Ala Ala Ala Thr Pro Ala Thr Pro
1 5 10 15

Ala Ala Thr Pro
20

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<210> 30
<211> 20
<212> PRT
<213> Lolium perenne

<400> 30

Ala Ala Thr Pro Ala Thr Pro Ala Ala Thr Pro Ala Ala Ala Gly Gly
1 5 10 15

Lys Ala Thr Thr
20

<210> 31
<211> 20
<212> PRT
<213> Lolium perenne

<400> 31

Thr Pro Ala Ala Ala Gly Gly Lys Ala Thr Thr Asp Glu Gln Lys Leu
1 5 10 15

Leu Glu Asp Val
20

<210> 32
<211> 20
<212> PRT
<213> Lolium perenne

<400> 32

Thr Thr Asp Glu Gln Lys Leu Leu Glu Asp Val Asn Ala Gly Phe Lys
1 5 10 15

Ala Ala Val Ala
20

<210> 33
<211> 20
<212> PRT
<213> Lolium perenne

<400> 33

Asp Val Asn Ala Gly Phe Lys Ala Ala Val Ala Ala Ala Ala Asn Ala
1 5 10 15

Pro Pro Ala Asp

- 12 -

20

<210> 34
<211> 20
<212> PRT
<213> Lolium perenne

<400> 34

Val Ala Ala Ala Ala Asn Ala Pro Pro Ala Asp Lys Phe Lys Ile Phe
1 5 10 15

Glu Ala Ala Phe
20

<210> 35
<211> 20
<212> PRT
<213> Lolium perenne

<400> 35

Ala Asp Lys Phe Lys Ile Phe Glu Ala Ala Phe Ser Glu Ser Ser Lys
1 5 10 15

Gly Leu Leu Ala
20

<210> 36
<211> 20
<212> PRT
<213> Lolium perenne

<400> 36

Ala Phe Ser Glu Ser Ser Lys Gly Leu Leu Ala Thr Ser Ala Ala Lys
1 5 10 15

Ala Pro Gly Leu
20

<210> 37
<211> 20
<212> PRT
<213> Lolium perenne

<400> 37

Leu Ala Thr Ser Ala Ala Lys Ala Pro Gly Leu Ile Pro Lys Leu Asp
1 5 10 15

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Thr Ala Tyr Asp
20

<210> 38
<211> 20
<212> PRT
<213> Lolium perenne

<400> 38

Gly Leu Ile Pro Lys Leu Asp Thr Ala Tyr Asp Val Ala Tyr Lys Ala
1 5 10 15

Ala Glu Gly Ala
20

<210> 39
<211> 20
<212> PRT
<213> Lolium perenne

<400> 39

Tyr Asp Val Ala Tyr Lys Ala Ala Glu Gly Ala Thr Pro Glu Ala Lys
1 5 10 15

Tyr Asp Ala Phe
20

<210> 40
<211> 20
<212> PRT
<213> Lolium perenne

<400> 40

Gly Ala Thr Pro Glu Ala Lys Tyr Asp Ala Phe Val Thr Ala Leu Thr
1 5 10 15

Glu Ala Leu Arg
20

<210> 41
<211> 20
<212> PRT
<213> Lolium perenne

<400> 41

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Ala Phe Val Thr Ala Leu Thr Glu Ala Leu Arg Val Ile Ala Gly Ala
 1 5 10 15

Leu Glu Val His
 20

<210> 42
 <211> 20
 <212> PRT
 <213> Lolium perenne

<400> 42

Leu Arg Val Ile Ala Gly Ala Leu Glu Val His Ala Val Lys Pro Ala
 1 5 10 15

Thr Glu Glu Val
 20

<210> 43
 <211> 20
 <212> PRT
 <213> Lolium perenne

<400> 43

Val His Ala Val Lys Pro Ala Thr Glu Glu Val Pro Ala Ala Lys Ile
 1 5 10 15

Pro Thr Gly Glu
 20

<210> 44
 <211> 20
 <212> PRT
 <213> Lolium perenne

<400> 44

Glu Val Pro Ala Ala Lys Ile Pro Thr Gly Glu Leu Gln Ile Val Asp
 1 5 10 15

Lys Ile Asp Ala
 20

<210> 45
 <211> 20
 <212> PRT

- 15 -

<213> Lolium perenne

<400> 45

Gly	Glu	Leu	Gln	Ile	Val	Asp	Lys	Ile	Asp	Ala	Ala	Phe	Lys	Ile	Ala
1			5					10						15	

Ala	Thr	Ala	Ala
		20	

<210> 46

<211> 20

<212> PRT

<213> Lolium perenne

<400> 46

Asp	Ala	Ala	Phe	Lys	Ile	Ala	Ala	Thr	Ala	Ala	Asn	Ala	Ala	Pro	Thr
1				5					10					15	

Asn	Asp	Lys	Phe
		20	

<210> 47

<211> 20

<212> PRT

<213> Lolium perenne

<400> 47

Ala	Ala	Asn	Ala	Ala	Pro	Thr	Asn	Asp	Lys	Phe	Thr	Val	Phe	Glu	Ser
1			5						10					15	

Ala	Phe	Asn	Lys
		20	

<210> 48

<211> 20

<212> PRT

<213> Lolium perenne

<400> 48

Lys	Phe	Thr	Val	Phe	Glu	Ser	Ala	Phe	Asn	Lys	Ala	Leu	Asn	Glu	Cys
1				5					10					15	

Thr	Gly	Gly	Ala
		20	

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<210> 49
<211> 20
<212> PRT
<213> Lolium perenne

<400> 49

Asn Lys Ala Leu Asn Glu Cys Thr Gly Gly Ala Tyr Glu Thr Tyr Lys
1 5 10 15

Phe Ile Pro Ser
20

<210> 50
<211> 20
<212> PRT
<213> Lolium perenne

<400> 50

Gly Ala Tyr Glu Thr Tyr Lys Phe Ile Pro Ser Leu Glu Ala Ala Val
1 5 10 15

Lys Gln Ala Tyr
20

<210> 51
<211> 20
<212> PRT
<213> Lolium perenne

<400> 51

Pro Ser Leu Glu Ala Ala Val Lys Gln Ala Tyr Ala Ala Thr Val Ala
1 5 10 15

Ala Ala Pro Glu
20

<210> 52
<211> 20
<212> PRT
<213> Lolium perenne

<400> 52

Ala Tyr Ala Ala Thr Val Ala Ala Ala Pro Glu Val Lys Tyr Ala Val
1 5 10 15

Phe Glu Ala Ala

- 17 -

20

<210> 53
<211> 20
<212> PRT
<213> Lolium perenne

<400> 53.

Pro Glu Val Lys Tyr Ala Val Phe Glu Ala Ala Leu Thr Lys Ala Ile
1 5 10 15

Thr Ala Met Thr
20

<210> 54
<211> 20
<212> PRT
<213> Lolium perenne

<400> 54

Ala Ala Leu Thr Lys Ala Ile Thr Ala Met Thr Gln Ala Gln Lys Ala
1 5 10 15

Gly Lys Pro Ala
20

<210> 55
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<400> 55

Met Thr Gln Ala Gln Lys Ala Gly Lys Pro Ala Ala Ala Ala Thr
1 5 10 15

Gly Ala Ala Thr
20

<210> 56
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<212> PRT
<213> Lolium perenne

<400> 56

Pro Ala Ala Ala Ala Ala Thr Gly Ala Ala Thr Val Ala Thr Gly Ala
1 5 10 15

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Ala Thr Ala Ala
20

<210> 57
<211> 20
<212> PRT
<213> Lolium perenne

<400> 57

Ala Thr Val Ala Thr Gly Ala Ala Thr Ala Ala Ala Gly Ala Ala Thr
1 5 10 15

Ala Ala Ala Gly
20

<210> 58
<211> 20
<212> PRT
<213> Lolium perenne

<400> 58

Thr Gly Ala Ala Thr Ala Ala Ala Gly Ala Ala Thr Ala Ala Ala Gly
1 5 10 15

Gly Tyr Lys Ala
20

<210> 59
<211> 276
<212> PRT
<213> Lolium perenne

<400> 59

Ala Asp Ala Gly Tyr Thr Pro Ala Ala Ala Thr Pro Ala Thr Pro
1 5 10 15

Ala Ala Thr Pro Ala Ala Ala Gly Gly Lys Ala Thr Thr Asp Glu Gln
20 25 30

Lys Leu Leu Glu Asp Val Asn Ala Gly Phe Lys Ala Ala Val Ala Ala
35 40 45

Ala Ala Asn Ala Pro Pro Ala Asp Lys Phe Lys Ile Phe Glu Ala Ala
50 55 60

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Phe Ser Glu Ser Ser Lys Gly Leu Leu Ala Thr Ser Ala Ala Lys Ala
65 70 75 80

Pro Gly Leu Ile Pro Lys Leu Asp Thr Ala Tyr Asp Val Ala Tyr Lys
85 90 95

Ala Ala Glu Gly Ala Thr Pro Glu Ala Lys Tyr Asp Ala Phe Val Thr
100 105 110

Ala Leu Thr Glu Ala Leu Arg Val Ile Ala Gly Ala Leu Glu Val His
115 120 125

Ala Val Lys Pro Ala Thr Glu Glu Val Pro Ala Ala Lys Ile Pro Thr
130 135 140

Gly Glu Leu Gln Ile Val Asp Lys Ile Asp Ala Ala Phe Lys Ile Ala
145 150 155 160

Ala Thr Ala Ala Asn Ala Ala Pro Thr Asn Asp Lys Phe Thr Val Phe
165 170 175

Glu Ser Ala Phe Asn Lys Ala Leu Asn Glu Cys Thr Gly Gly Ala Tyr
180 185 190

Glu Thr Tyr Lys Phe Ile Pro Ser Leu Glu Ala Ala Val Lys Gln Ala
195 200 205

Tyr Ala Ala Thr Val Ala Ala Ala Pro Glu Val Lys Tyr Ala Val Phe
210 215 220

Glu Ala Ala Leu Thr Lys Ala Ile Thr Ala Met Thr Gln Ala Gln Lys
225 230 235 240

Ala Gly Lys Pro Ala Ala Ala Ala Ala Thr Gly Ala Ala Thr Val Ala
245 250 255

Thr Gly Ala Ala Thr Ala Ala Ala Gly Ala Ala Thr Ala Ala Ala Gly
260 265 270

Gly Tyr Lys Ala
275

- 20 -

<210> 60
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 <400> 60

Ala Asp Ala Gly Tyr Thr Pro Ala Ala Ala Thr Pro Ala Thr Pro
 1 5 10 15

Ala Ala Thr Pro Ala Ala Gly Gly Gly Lys Ala Thr Thr Asp Glu Gln
 20 25 30

Lys Leu Leu Glu Asp Val Asn Ala Gly Phe Lys Ala Ala Val Ala Ala
 35 40 45

Asp Ala Asn Ala Pro Pro Ala Asp Lys Phe Lys Ile Phe Glu Ala Ala
 50 55 60

Phe Ser Glu Ser Cys Lys Gly Leu Leu Ala Thr Ser Asp Ala Lys Ala
 65 70 75 80

Pro Gly Leu Ile Leu Lys Leu Asp Thr Asp Tyr Asp Val Ala Tyr Lys
 85 90 95

Ala Gly Glu Gly Ala Thr Pro Glu Ala Lys Tyr Asp Ala Phe Val Thr
 100 105 110

Ala Leu Thr Glu Ala Leu Arg Val Ile Ala Gly Ala Leu Glu Val His
 115 120 125

Ala Val Lys Pro Ala Thr Glu Glu Val Pro Ala Ala Lys Ile Pro Thr
 130 135 140

Gly Glu Leu Gln Ile Val Asp Lys Ile Asp Ala Ala Phe Lys Ile Ala
 145 150 155 160

Ala Thr Ala Ala Asn Ala Ala Pro Thr Asn Asp Lys Phe Thr Val Phe
 165 170 175

Glu Ser Ala Phe Asn Lys Ala Leu Lys Glu Cys Thr Gly Gly Ala Tyr
 180 185 190

Glu Thr Tyr Lys Phe Ile Pro Ser Leu Glu Ala Ala Val Lys Gln Ala

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195

200

205

Tyr Ala Thr Thr Val Ala Ala Ala Pro Glu Val Lys Tyr Ala Val Phe
 210 215 220

Glu Ala Ala Leu Thr Lys Ala Ile Thr Ala Met Ser Gln Ala Gln Lys
 225 230 235 240

Val Ala Lys Pro Ala Ala Ala Ala Ala Thr Gly Ala Ala Thr Val Ala
 245 250 255

Thr Gly Ala Ala Thr Ala Ala Ala Gly Gly Ala Thr Ala Ala Ala Gly
 260 265 270

Gly Tyr Lys Ala
 275

<210> 61
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 <212> PRT
 <213> Lolium perenne

<400> 61

Ala Asp Ala Gly Tyr Ala Pro Ala Thr Pro Ala Thr Pro Ala Ala Pro
 1 5 10 15

Ala Thr Ala Ala Thr Pro Ala Thr Pro Ala Thr Pro Ala Thr Pro Ala
 20 25 30

Ala Val Pro Ser Gly Lys Ala Thr Thr Glu Glu Gln Lys Leu Ile Glu
 35 40 45

Lys Ile Asn Ala Gly Phe Lys Ala Ala Val Ala Ala Ala Ala Val Val
 50 55 60

Pro Pro Ala Asp Lys Tyr Lys Thr Phe Val Glu Thr Phe Gly Thr Ala
 65 70 75 80

Thr Asn Lys Ala Phe Val Glu Gly Leu Ala Ser Gly Tyr Ala Asp Gln
 85 90 95

Ser Lys Asn Gln Leu Thr Ser Lys Leu Asp Ala Ala Leu Lys Leu Ala
 100 105 110

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Tyr Glu Ala Ala Gln Gly Ala Thr Pro Glu Ala Lys Tyr Asp Ala Tyr
 115 120 125

Val Ala Thr Leu Thr Glu Ala Leu Arg Val Ile Ala Gly Thr Leu Glu
 130 135 140

Val His Ala Val Lys Pro Ala Ala Glu Glu Val Lys Val Gly Ala Ile
 145 150 155 160

Pro Ala Ala Glu Val Gln Leu Ile Asp Lys Val Asp Ala Ala Tyr Arg
 165 170 175

Thr Ala Ala Thr Ala Ala Asn Ala Ala Pro Ala Asn Asp Lys Phe Thr
 180 185 190

Val Phe Glu Asn Thr Phe Asn Asn Ala Ile Lys Val Ser Leu Gly Ala
 195 200 205

Ala Tyr Asp Ser Tyr Lys Phe Ile Pro Thr Leu Val Ala Ala Val Lys
 210 215 220

Gln Ala Tyr Ala Ala Lys Gln Ala Thr Ala Pro Glu Val Lys Tyr Thr
 225 230 235 240

Val Ser Glu Thr Ala Leu Lys Lys Ala Val Thr Ala Met Ser Glu Ala
 245 250 255

Glu Lys Glu Ala Thr Pro Ala Ala Ala Ala Thr Ala Thr Pro Thr Pro
 260 265 270

Ala Ala Ala Thr Ala Thr Ala Thr Pro Ala Ala Ala Tyr Ala Thr Ala
 275 280 285

Thr Pro Ala Ala Ala Thr Ala Thr Ala Thr Pro Ala Ala Ala Thr Ala
 290 295 300

Thr Pro Ala Ala Ala Gly Gly Tyr Lys Val
 305 310